The role of development finance institutions in tackling global challenges

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Abbreviations

ACP	African, Caribbean and Pacific
ADM	Asia Debt Management
AFD	French Development Agency
AfDB	African Development Bank
BIO	Belgian Investment Company for Developing Countries
CDC	Formerly Commonwealth Development Corporation, now CDC Group
COFIDES	Spanish Development Finance Company
DEG	German Investment Corporation
DFI	Development Finance Institution
DOTS	Development Outcome Tracking System
EBRD	European Bank for Reconstruction and Development
EDFI	European Development Finance Institutions
EIB	European Investment Bank
ETTG	European Think Tanks Group
EU	European Union
FDI	Foreign Direct Investment
FMO	Netherlands Development Finance Company
GDP	Gross Domestic Product
GEF	Global Environment Facility
GPR	Corporate Policy Project Rating
IDA	International Development Association
IFC	International Finance Corporation
IFI	International Financial Institution
IFU	Industrialisation Fund for Developing Countries
IFV	Investment Fund for Emerging Markets
IMF	International Monetary Fund
IØ	Investment Fund for Central and Eastern Europe
IPG	International Public Goods
KfW	German Development Bank
MDB	Multilateral Development Bank
MIGA	Multilateral Investment Guarantee Agency
ODA	Official Development Assistance
OeEB	Development Bank of Austria
OOF	Other Official Flow
OPIC	Overseas Private Investment Corporation
PPP	Purchasing Power Parity
PROPARCO	Promotion and Participation for Economic Cooperation
SBI	Belgian Corporation for International Investment
SEI	Sustainable Energy Initiative
SIFEM	Swiss Investment Fund for Emerging Markets
SIMEST	Italian Financial Institution for Companies Abroad
SOFID	Portuguese Development Finance Institution
TA	Technical Assistance
TIMS	Transition Impact Monitoring System
UN	United Nations
UN	UN Conference on Trade and Development
UNDP	UN Development Programme
WDI	World Development Indicator
WEF	World Economic Forum

Executive summary

The world is increasingly facing global challenges. Climate change, financial crises, food and oil price swings, security threats and increasing scarcity of water, energy and land resources are affecting growth and poverty prospects of developing countries more and more – yet the traditional thinking on development assistance is often rooted in national development plans. Meanwhile, development finance institutions (DFIs) measure their impact only at the micro level. We develop a mapping of policy responses, including the role of DFIs, in tackling global challenges.

DFIs have become more important over the past decade. They can provide finance (e.g. loans, guarantees, equity) for the public and private sectors. Private sector support by DFIs globally in terms of annual commitments has grown rapidly, from $15.4 billion in 2003, to $21.4 billion in 2005 and $33 billion in 2009. This represents more than a doubling in annual commitments over the past six years. DFI support is now equivalent to a quarter of official development assistance (ODA), although it is mostly not counted as ODA. There are 26 developing countries where investment by three DFIs (IFC, EIB and CDC) together have averaged between 2% and 12% of total domestic investment for the period for which data are available – this is quite considerable. Therefore, examining the *macro* effects of DFIs in terms of tackling global challenges is appealing.

As such, this paper shifts the debate on measuring the impacts of DFIs that support the private sector. Traditional impact assessments focus on micro-level impacts – but we argue that DFIs can play an important role in tackling global challenges. This requires an expansion of the focus of DFIs from addressing capital market failures to addressing market and coordination failures associated with technology adoption and the environment (in some cases DFIs already do this). The measurement of impacts also needs to reflect to what extent DFIs contribute towards tackling global challenges.

The paper develops a general methodology for estimating the aggregate impact of DFIs on investment (especially during financial crises and in post-conflict periods) and the ability of DFIs to improve energy efficiency. Using regression analyses, based on available data from EIB, EBRD, IFC and CDC, we find that DFIs increased total investment and improved energy efficiency in recipient countries compared with the constructed counterfactual. A one percentage point increase in DFI as a percentage of gross domestic product (GDP) would lead to a 0.8 percentage point change in the investment to GDP ratio. Hence, for 26 countries, DFIs have kept investment to GDP ratios more than 1.5 percentage points higher than would otherwise have been the case. We also find that investment by DFIs has increased total, post-conflict investment. We argue that such macro evidence is more appropriate for estimating leverage effects than the static financial additionality or leverage measures presented by DFIs. Further work could examine in which situations DFIs have the greatest leverage impact, and what policy levers could be used to improve the impact of DFIs in tackling global challenges.

We argue DFIs are able to increase investment and, owing to their locational presence, they are likely to be particularly additional in poorer countries. Thus, DFIs could be seen as a useful tool to promote investment and growth in poor countries. Hence, addressing the effects of global financial crises in poor countries might be possible through increasing DFI exposure to such countries in times of crises. This could be achieved partly by maintaining a good pipeline of projects so that, when a crisis hits, DFIs can step in immediately and support a range of projects counter-cyclically; and partly by linking better to additional source of finance (e.g. sovereign wealth funds). It also means that pull (softer terms) and push (more investment officers and better incentives) measures could be designed to stimulate DFI investment in post-conflict countries, and to tackle global challenges more generally.

1   Introduction

The world is increasingly facing global challenges which are setting a new context for development and growth, particularly in poor countries. Climate change (Stern, 2006), financial crises (e.g. te Velde et al. 2010), food and oil price swings, security threats and increasing scarcity in water, energy and land resources are affecting the prospects of developing countries more and more – yet the traditional thinking on development assistance is often rooted in national development plans.

This paper contributes to the literature on how aid and non-aid measures can help in addressing such global challenges. For example, international cooperation and policy and rule making in areas such as climate change, trade and global financial systems are of course crucial. International finance may also help – and it is important that public and private resources are mobilised to finance the provision of international public goods (IPGs) (Morrissey et al., 2002). Donors can also play an important role: alongside substantial bilateral programmes, they can support the international financial mechanisms that are often more appropriate for addressing global challenges.

Development finance institutions (DFIs) can provide finance (e.g. loans, guarantees, equity acquisitions) to the public sector (e.g. the International Development Association (IDA) and most parts of the multilateral development banks (MDBs)) and the private sector (the International Finance Corporation (IFC), the UK's CDC Group (formerly the Commonwealth Development Corporation), the German Investment Corporation (DEG), most of the European Bank for Reconstruction and Development (EBRD), part of the European Investment Bank (EIB)). The shareholders (donor countries) provide callable capital/endowments (counted as official development assistance (ODA)) to DFIs, which they use to provide loans (often counted as other official flows (OOFs)) and take equity positions that can leverage in other sources of finance, including private finance.

The business of DFIs has grown fast in recent years (e.g. Dellacha and te Velde, 2007; Perry, 2011) and they are increasingly visible in national economies. In value terms, DFI support to the private sector is equivalent to a quarter of ODA. However, while there is a significant debate on the macro effects of aid on investment and growth (e.g. Hansen and Tarp, 2001; Rajan and Subramanian, 2007) and, increasingly, on climate change, such a literature does not exist for the macro effects of DFIs. Instead, impact evaluations focus on the micro level, making it difficult to assess the aggregate effects of DFIs in tackling global challenges.

This paper aims to map DFI instruments onto global challenges and to provide summary metrics for this; to present detailed evidence on the effectiveness of DFIs in terms of tackling global challenges (e.g. by examining the role of DFIs in promoting investment and growth during the global financial crisis); and to understand how donors might support DFIs to address global challenges. It forms part of a project consisting of two papers, along with Massa (2011), examining in detail the growth effects of DFIs, and can be used in conjunction with micro-level assessments and anecdotal evidence. The papers contribute to the emerging literature on the (macro) effects of DFIs.

The paper first provides background information on DFIs (Section 2) and then reviews a set of global challenges and possible policy responses (Section 3). Section 4 discusses the possible roles for DFIs in overcoming these global challenges (e.g. what market failures they address, what blend of instruments they can use in which situations). Section 5 presents a new metric and a number of examples in measuring the impact of DFIs in terms of tackling global challenges. Section 6 concludes.

2   DFIs: background information

The objectives of DFIs are one or more of the following: to invest in sustainable private sector projects; to maximise impacts on development; to remain financially viable in the long term; and to mobilise private sector capital. Many DFIs are owned by the public sector only (CDC, DEG, Sweden's Swedfund, Norway's Norfund, the US Overseas Private Investment Corporation (OPIC)). France's Promotion and Participation for Economic Cooperation (PROPARCO), the Netherlands Development Finance Company (FMO), the Spanish Development Finance Company (COFIDES) and the Italian Financial Institution for Companies Abroad (SIMEST) have a mixed public and private ownership structure. The Swiss Investment Fund for Emerging Markets (SIFEM) is privately owned. The multilateral and regional DFIs have multiple shareholders from various countries.

DFIs provide finance (e.g. loans, guarantees, equity investment) to the public sector (most parts of the multilateral development financial institutions, such as the MDBs, e.g. the African Development Bank (AfDB)) or to the private sector (e.g. IFC; CDC; DEG; most of EBRD). The shareholders (donor countries) provide callable capital/endowments to the DFIs, which they use to provide such loans and equity positions. These can leverage in other sources of finance, including private finance. In this paper, we focus on DFIs that support the private sector.

While the core business of DFIs is to invest financial resources, they also provide project-specific and general technical assistance (TA) and promote standards in the funds or companies in which they invest. Estimates based on the annual accounts of the main DFIs show around $33 billion-worth of new DFI investments in the private sector in 2009 (in the form of loans, guarantees and changes in equity positions). The largest DFIs include IFC, EBRD and EIB; these are followed by a number of large bilaterals (DEG, FMO, CDC and PROPARCO) and then a long tail of small DFIs.

Private sector support by DFIs globally has grown rapidly in terms of new annual commitments, from $15.4 billion in 2003 to $21.4 billion in 2005 (Dellacha and te Velde, 2007) and $33 billion in 2009. This represents more than a doubling in the past six years, equivalent to a quarter of ODA.

In terms of TA, IFC's total expenditure on advisory services was $268 million in 2009 alone. Meanwhile, by 2009, EBRD had administered 184 technical cooperation fund agreements, amounting to an aggregate €1.3 billion and around $78 million in 2007. EIB's Investment Facility provided €11.5 million-worth of TA (in addition to interest rate subsidies) in 2009, but much more through other funds. In 2007, DEG and FMO provided $8 million-worth of TA each. In aggregate, this could easily reach $400-worth of grants channelled through DFIs each year.[1]

Key strategic decisions for DFIs centre on the sectors, countries and instruments in which they invest. Table 1 shows that DFIs tend to use loan instruments more than equity instruments, but with large variability across institutions. In terms of geographical distribution, IFC invested 13% in Sub-Saharan Africa (June 2010). In 2009, 52% of CDC's portfolio was invested in Africa (45% in Sub-Saharan Africa), 17% of DEG's and 29% of FMO's.

All of these parameters are under constant review. For example, IFC's exposure in Sub-Saharan Africa was less than 10% a few years ago. CDC's recent reform requires it to be even more focused on Sub-Saharan Africa and South Asia, but with a more even distribution across different type of financial instruments.

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1 Meanwhile, blending platforms (e.g. the European Union (EU) Africa Infrastructure Trust Fund) absorbed some €1 billion in the first few years for developing regions (ETTG, 2011).

Table 1: Exposure of DFIs, by instrument and sector, 2009 (%)

	Instrument (share of portfolio)			Sector (share of portfolio)				
	Equity	Loans	Guarantees	Financial	Infrastructure	Agribusiness	Industry	Other
BIO	38	62	0	45	20	5	30	N/A
CDC	96	4	0	23	34	6	18	19 (i)
COFIDES	94	6	0	1	45	5	47	3
DEG	42	57	2	35	19	13	27	6
Finnfund	45	53	2	19	28	1	44	7
FMO	45	51	3	42	24	3	30	2
IFU/IFV/IØ	53	44	3	5	10	15	63	8
Norfund	85	15	0	23	55	5	11	5
OeEB	47	42	11	100	N/A	N/A	N/A	N/A
PROPARCO	14	84	2	45	36	4	12	2
SBI	57	43	0	21	13	18	47	0
SIFEM	88	12	0	18	3	N/A	79	N/A
SIMEST	100	0	0	2	8	8	78	4
SOFID	0	83	17	N/A	N/A	N/A	100	N/A
Swedfund	64	36	0	8	22	1	64	5
EBRD (**)	15	85	0	36	37	8	18	N/A
EIB (**)				2	65	10	23	N/A
IFC (**)	18	55	27*	48	25	2	25	N/A

Notes:
Other sectors include: global financial markets; global manufacturing and services; health and education; oil, gas, mining and chemicals; sub-national finance; information and communication technology; etc. (i) In the case of CDC, for example, the 'other' sector category includes health care 8%; mining 6%; others 6%.
(*) The Global Trade Finance Programme is included. Moreover, a new agreement will allow IFC to market the products of the Multilateral Investment Guarantee Agency (MIGA), a deal which will give businesses added comfort as they move into riskier markets. In 2010, the percentages had increased to 31%, whereas loans had fallen to 45% and equity (including equity-type, quasi-equity products) had increased to 23%.
(**) For sectors and instruments we used commitments.
BIO = Belgian Investment Company for Developing Countries; Finnfund (Finland); IFU = Industrialisation Fund for Developing Countries, IFV = Investment Fund for Emerging Markets, IØ = Investment Fund for Central and Eastern Europe (Denmark); OeEB = Development Bank of Austria; SBI = Belgian Corporation for International Investment; SOFID = Portuguese Development Finance Institution.
Source: European Development Finance Institutions (EDFI) annual report, annual DFI reports and own calculations, in Kingombe et al. (2011).

Appendix B, Table B2, shows that, in some 26 countries, investments by IFC, EIB and CDC combined amount on average (over the years with available data) to more than 2% of total domestic investment. Table B1 in Appendix B provides actual data sorted by importance of DFI exposure compared with total domestic investment.

3 Appropriate policy responses to global challenges

Global challenges often relate to the failure to provide IPGs (Morrissey et al., 2002), for example a clean, stable and secure environment, eradication of communicable diseases, globally available knowledge and global economic governance. It can also be framed in terms of risks and opportunities.

The World Economic Forum's (WEF's) 2011 Global Risk Report presents the risks that are most likely and that will have greatest impact in the coming decade: climate change, fiscal crises, economic disparity, global governance failures, storms and cyclones, geopolitical conflict, corruption, flooding and water insecurity. Recent discussions have also focused on commodity and oil volatility. The world is becoming richer and more globalised, but is also increasingly affected by crises on a global scale, which can have major effects on poor countries.

For the purposes of this paper, we divide the challenges into three categories: 1) economic: maintaining investment during global economic crises; 2) environmental: facilitating the transition towards a low carbon development path; and 3) other: providing global health and security and addressing volatility and equity concerns.

3.1 Appropriate policy responses: the role of the private sector DFIs

There are also opportunities to address these global risks. Here, we distinguish among four different types of policy responses to tackle these global challenges: 1) global rules; 2) developed country policies; 3) aid and public sector DFIs; and 4) DFIs supporting the private sector. When thinking about the role of private sector DFIs (the topic of this paper), we also need to take into account the role of other policy responses. Table 2 below maps policy responses onto global challenges. For example, the transition towards a low carbon development path or the safeguarding of the stability of the global financial system requires global rules. On the other hand, protecting the incomes of the poorest in a crisis may require grant aid. Both of these are situations with a limited role for private sector DFIs, yet we also think that the role of private sector is wider than addressing capital market imperfections.

Private sector DFIs are involved whenever there are market failures. In general terms, DFI support is most valuable in activities where there is a lack of capital but where the private sector can be leveraged in; where technological and environmental market failures are greatest; where the effects of DFI interventions are greatest (compared with other instruments such as grant aid and based on the comparative advantage of the DFI); in sectors that matter most for development, using the instruments that are most appropriate; and in countries (or states in a country) that need support the most. Below we discuss where DFIs can step in.

Table 2: **Global challenges and policy responses: illustrations**

	Economic	Environmental	Other
Global rules (IPGs)			
	Global rules on capital markets (e.g. G20)	Rules on carbon emissions to get interest from private sector (UNFCCC)	Global rules on public health; UN Security Council on conflict (promote IPGs)
Developed country policies			
Domestic	Promote systemic financial stability	Promote a low carbon domestic economy	Contribute domestically to IPGs
External	Export and investment credits	Trade and investment policies that promote low carbon development positively	Contribute non-aid funds to IPGs
Aid and public sector DFIs (e.g. IDA)			
Aid	Maintain critical public spending in low-income countries – improve counter-cyclicality (e.g. crisis response window)	Climate finance to be new and additional; however, some support for energy efficiency (Rio marker) classified as ODA	Provide aid to IPGs – especially in case of 'weakest link' finance
Blended aid	Maintain critical public spending in more resilient countries - improve counter-cyclicality	Blended finance for public sector projects (e.g. some of EIB), with grants covering project preparation or green purposes	Important role to provide blended finance to IPGs – especially in case of 'weakest link' finance but middle-income countries
Private sector DFIs (e.g. IFC, CDC)			
Loans, direct equity, equity funds, guarantees	Support private sector investment by correcting market and coordination failures in capital markets	Support green private sector investment by correcting market failures (relating to capital markets, technology and environment)	Possible opportunities (e.g. promoting investment in post-conflict countries)
TA through private sector DFIs; subsidised loans and lower return equity	Support private sector investment by correcting market and coordination failures in capital markets	Account for externalities, environmental impact assessments, etc	Possible opportunities (e.g. promoting investment in post-conflict countries)

Capital market imperfections

The traditional role for DFIs is to address market and coordination failures in capital markets. Dixit and Pindyck (1994) argue that uncertainty has significant negative effects on investment, when the latter involves large sunk and irreversible costs and when there is the option to delay the decision to make the investment until further information becomes available. For example, infrastructure and other activities with high economic returns play an important role in development, but these needs are largely unmet. This is because the provision of such projects is associated with public goods aspects, which tend to lower the incentives for the private sector to provide an optimal level. Investments such as those in infrastructure contain substantial risks because of the large upfront capital investments and the long payback periods influenced by government policy and practice. The private sector may hold off investing until more information becomes available, making the environment less risky.

DFIs can help to correct these risk perceptions, promoting favourable conditions under which private investment takes place and encouraging the provision of a socially optimal amount of infrastructure and other activities with economic returns. DFIs engage particularly in countries with restricted access to domestic and foreign capital markets. They specialise in loans with longer maturities and other financial products which are appropriate for financing long-term infrastructure projects. DFIs aim to be catalysts, helping companies implement investment plans. They provide risk mitigation that enables investors to proceed with plans they might otherwise abandon. Local currency loans are particularly important given that revenue flows are often in local currency. Further, because of the unique characteristics of DFIs, they have a comparative advantage in providing finance that is related to the design and implementation of reforms and capacity-building programmes adopted by governments.

Knowledge-related market failures

The process of technological development is associated with market failures in innovative activity and identification and adoption of clean technology. These market failures centre on the externalities of the learning process and the public goods aspects of technological knowledge (Justman and Teubal, 1995). First, uncertainty and externalities among early users learning about the application of the new technology mean that information is costly for individual firms to obtain and appropriate. Second, the codification and standardisation of experience and knowledge can offer social benefits in that they permit rapid diffusion of the technology as well as knowledge about it, but individual firms will not be able to appropriate all benefits of developing a new standard. Finally, network externalities arise when new users of technology depend on the existence of a large user and support staff base.

Market failures that relate to imperfect information surrounding investment in preserving the environment, such as encouraging energy efficiency (Koopmans and te Velde, 2001) are the same market failures that characterise technological development. Firms may not have full knowledge of the existence of best practices in environmentally friendly techniques, even though they may be profitable. Similarly, implementation itself creates a positive externality by providing useful information to other adopters. For instance, it may turn out that realised returns of investments fall short of the returns promised by engineers (Hassett and Metcalf, 1997), possibly because engineers fail to acknowledge (local) adaptation costs.

Environmental market failures

There are substantial subsidies for the usage of fossil fuel even though this has negative consequences for the environment, while the positive externalities of renewable energy such as solar power or hydropower may not be recognised. DFIs can direct their activities (and hence implicit subsidies) towards activities with positive externalities for the environment.

Coordination failures

Coordination failures go beyond static market failures and form crucial impediments to transforming economies into high-growth performers. Coordination failures operate between linked firms, in clusters of firms and in relation to the economy as a whole. Failure of coordinating capacity among economic agents might prevent an economy from reaching a higher development path or a green growth path. Countries can get stuck in an inefficient equilibrium owing to the nature of technology and markets (which could be a high-carbon path), even when government policy does not penalise normal private sector activities (Rodrik, 1996). For example, when the global financial crisis broke out, there was less demand and supply of export credits. As the private sector failed to provide export credits, the public sector had to provide a signal to get out of the low credit low exports trap.

3.2   Appropriate DFI instruments

DFIs use a wide variety of instruments. There is little theoretical and empirical evidence to use in deciding on the most appropriate instruments at a general level. Most projects need equity and loans in different quantities. At a macro level, equity provision adds to ODA but not to a country's debt, while loans may add to a country's debt (in many cases guaranteed by the local government) and tends to be counted as OOFs.

Comparing direct equity (companies) with fund of funds (which can then be used for investments), direct equity can be more targeted, with greater influence and control. Investments in equity funds can rely on the expertise of local fund managers, are less human resource initiative and are better at mobilising third capital, but require long-term commitments (House of Commons, 2011).

Not all private sector DFIs channel TA (even though, implicitly, all DFIs are subsidised), but most do and some charge their investee companies (part). Best practice would be to use subsidies for project preparation and impact assessments rather than sweetening the deals or subsidising interest rates on loans (te Velde and Warner, 2007). Subsidies could also be used

as output-based aid models. Generally, though, private sector DFIs have the mandate to engage in deals according to commercial terms.

It is important to consider that DFIs support and depend on requests from the private sector. The demand-driven nature of the DFIs is positive, because lack of ownership will be less of a problem when all projects are based on demand. However, at the same time, it might reduce the scope for addressing global challenges because the extent to which this occurs depends on private sector demand for individual projects. DFIs work with individual projects which can take a long time to come to fruition, sometime years.

Recently, there has been much attention to the substantial costs of project preparation, including upstream sector reform and preparation of individual projects through, for example, necessary impact assessments. Cost estimates suggest that these can be substantial for large projects, amounting to 2-10% of total financing costs.[2] Depending on the pipeline of projects, but especially when demand from the private sector is low, more emphasis needs to be paid to project preparation and the building-up of a quality pipeline of projects which can be activated quickly.

2 Preparation costs suggested at a G20 infrastructure conference in Cape Town on 29 June 2011.

4 Measuring the contribution of DFIs in tackling global challenges

4.1 Some shortcomings of standard DFI impact assessments

The traditional aim of DFIs has been to address capital market imperfections and invest in viable enterprises and financial intermediaries. The associated measure of success has been the number of firms and jobs supported successfully. DFIs use three different types of assessment tools: IFC's Development Outcome Tracking System (DOTS), EBRD's Transition Impact Monitoring System (TIMS) and DEG's Corporate Policy Project Rating (GPR) (for a further review see (Massa, 2011). Because DFIs have different systems for *ex-ante* assessments, it is difficult to compare 'development impact' on the basis of their own data. A comparison of a simple measure such as the percentage of successful projects is difficult to interpret when the criteria on which this is based vary by DFI. An IFC-commissioned study (Grettve, 2007) reviews scoring of projects as 'successful' in annual reports: DEG (72%), FMO (69%), EBRD (66%) and IFC (59%).

A further challenge is that, while some indicators might be more or less comparable, for example number of jobs created and supported, the number on its own may not be indicative of a good or bad overall outcome, as this will depend on the counterfactual, which is a dynamic process involving spillovers and indirect effects. Table 3 shows that DEG and EDFI support more labour-intensive projects and the IFC supports capital-intensive projects. But it does not show the overall macro impact, as we argue below.

Table 3: **Comparing *ex-ante* development impact (selected indicators)**

	DEG	EDFI	IFC
Jobs supported			
Commitments (€ millions)	918	3800	5754
Employment created and supported (1,000s)	159	614	142.5
Employment per (€ millions)	174	162	25
Contribution to government revenues			
Commitments (€ millions)	918	3800	5754
Payments (€ millions)	524	1545	747.6
Payments (€ million per € millions)	0.9	0.41	0.13

Notes: IFC aggregated from regions. EDFI data presented are on an extrapolation basis.
Sources: DEG presentation for 2006; IFC annual report for 2006/07).

If we acknowledge that addressing global challenges is indeed one of the major aims of DFIs, we need to design a framework that is able to measure such a contribution. This means we need to understand how such micro-level investments contribute to the bigger global challenges. The essence of such a framework is to measure the macroeconomic impact, which goes beyond micro-level assessments that are the focus of DFI evaluation departments.

The rest of this section shows how we can design a framework for macro-level impact in two cases: maintaining investment in terms of crises and facilitating the transition to a low carbon development path.

4.2 Maintaining investment and growth during crises: how to measure additionality?

DFIs can help developing countries to invest and grow more only when DFI investments are additional. DFIs provide three types of evidence on additionality, which we describe as a situation where there is more investment (public and private) in a country than there would have been had there been no DFI investment. First, they suggest that their presence has

catalysed other investments through descriptions and historical accounts.[3] Second, they provide so-called leverage ratios indicating how much the private sector or other DFIs have invested alongside.[4] Third, DFIs point to the distribution of their portfolio. By allocating funds to countries that have little access to private capital markets, DFI investment would by definition be additional.

For the purposes of this paper, this is unsatisfactory for a number of reasons. For every good micro story of catalytic effects there might be a negative one. Leverage ratios could be a sign of additionality, or the opposite when DFIs invest in locations that attract other funds anyway. No DFI provides macroeconomic evidence of additionality in a dynamic sense (spillovers and indirect effects).

Conceptually, additionality at the macro level can be approached in two ways. In a static sense, DFIs can help to create new business by providing capital to such business (or expansions of existing business) that would otherwise not have had access. In a dynamic sense, DFIs can crowd in or crowd out existing investment. It can take over market share from existing business, or it can lead to new investments by other companies through positive spillovers through the stamp of approval or the productivity and growth effects (backward and forward linkages). The sum of these static and dynamic effects determines the level of additionality, and the degree to which DFIs can support investment.

The effects of DFIs therefore need to be measured at an aggregated level (sector or national measures). Suppose we are able to explain the level of investment (I) in a given country i:

$I_i = f (GDP_i, other_i)$

where *other* denotes other effects. We then would like to assess how DFI investments affect domestic investment through the static and dynamic effects. This can be done in the following way:

$I_i = f (GDP_i, DFI_i, other_i)$

where *DFI* is a measure of DFI exposure to that country. The coefficient on the DFI variable combines two types of effects: 1) the composition or static effects and 2) the dynamic effects. While we may also want to disentangle these effects, we are also interested in the combined effects: do DFIs lead to more investment (and growth) than otherwise would have been the case?

In the companion paper to this one, Massa (2011) examines the growth effects of DFIs in detail. She estimates:

GDP per capita growth $_i$ = f (DFI $_i$, other$_i$)

where *other* includes foreign direct investment (FDI), trade, government expenditure and the inflation rate. Because the growth effects might take a little longer to emerge than the effects on investment, DFI is lagged, in addition to a lagged dependent variable. Massa also provides

3 For instance, the chairman of MSI Cellular, a telephone company operating throughout Africa, argued that 'CDC was our first investor and their presence helped MSI attract both other developmental finance and private sector money from the likes of Citigroup and AIG', suggesting that in this case a demonstrator effect may have facilitated private and other third capital. Fund managers would like to secure investors early on, as a stamp of approval to attract other capital. CDC has committed to the Sierra Investment Fund, the first ever private equity fund in Sierra Leone, and to Rabo Equity Advisor's India Agribusiness Fund, the first private equity fund in India focused solely on this sector. It is also expected to finalise a $10 million commitment to Frontier Fund Private Equity, the first fund of its kind in Bangladesh.
4 Kingombe et al. (2010) estimate that every dollar of CDC investment coincides with $5 of other investment. Since 2004, CDC has committed more than $5 billion to 65 fund managers. Alongside this, other investors have committed a total of $24.3 billion. Capital from other DFIs accounts for only $2.3 billion of this figure. Using CDC's new methodology for measuring third party capital mobilisation, third party capital attributable to CDC is $4,187 million. IFC argues that every dollar of its investment leverages about $3 from others. For EBRD, it is around $1: it suggests that, alongside €7.9 billion investment in 2009, it attracted additional co-financing worth €5.1 billion. Of this, €2.3 billion came from private and €2.8 billion from public co-financiers, of which €2.7 billion came from the international financial institutions (IFIs) (2008: €0.4 billion).

a sectoral analysis for 101 countries over 1986-2009, which shows that DFIs have a stronger growth impact in lower-income than in higher-income economies. A 10% increase in multilateral DFIs' commitments increases per capita gross domestic product (GDP) growth by 1.3% in lower-income countries and by 0.9% in higher-income countries.

One further, particular interest is to see whether DFIs can help to raise investment in conflict-affected countries, especially in the post-conflict period. Collier (2007) argues that there is a window of opportunity just after conflict has ended to ensure that a relapse back into conflict does not occur. In order to understand the role of DFIs in conflict-affected countries, we need to examine 1) whether DFIs allocate more investment to conflict-affected countries; 2) whether they use the post-conflict period to increase their investment; and 3) whether they are able to leverage in additional finance.

4.3 Helping the transition to a low carbon development path: how to measure the effects of DFIs?

DFIs affect the country's ability to transition a country onto a low carbon path in a number of ways. They could encourage investment directly in energy efficiency, or indirectly by promoting technological change and a renewal of the capital stock, which might embody energy efficiency. In addition, a composition effect might play a role when aggregating the project into a macro-level effect. Supported projects can be more or less energy efficient than the average of the country. The combination of these effects is a measure of how DFIs help a country to move to a low carbon path, and it is not sufficient to measure only the energy savings of individual energy efficiency projects.

We explain energy efficiency (*EE*), expressed as energy use (kg of oil equivalent) per unit of GDP in constant prices, in country *I*, by a number of factors, such as the income level (high-income countries tend to be more energy efficient) and other factors such as the structure of the economy:

EE_i = f (Income level$_i$, other$_i$)

We then measure the aggregated impact of DFI investments on aggregated energy efficiency as follows:

EE_i = f (Income level $_i$, DFI $_i$, other$_i$)

5 DFIs and global challenges: empirical evidence

This section provides three illustrations of how the contribution of DFIs towards tackling global challenges can be estimated in practice. This is the first assessment of its kind: in the future, more specific studies could be done. One of the greatest challenges relates to data availability for some DFIs. Data on EIB and EBRD investment are easily available by country and year, but for IFC we had to construct data from past reports and portfolio data – we could do so for 2003 onwards. We obtained data on CDC country-level investment for 2004 onwards. For many other bilateral DFIs, we have so far been unable to obtain the required country-level data. The lack of transparency (e.g. in annual global DFI reports) is surprising given that all DFIs are backed implicitly or explicitly by taxpayers.

5.1 Maintaining investment and growth during crises: what does the macro evidence suggest?

We consider three empirical checks. First, did the DFIs step up their efforts during the global financial crisis of 2008-2009? Before the crisis, te Velde and Warner (2007) suggested that one of the biggest hurdles to DFIs undertaking a greater number of investments in poorer countries was a lack of sufficiently bankable projects. During the crisis, international commercial banks pulled away from the perceived risks of long-term debt finance in the region, and in some cases DFIs filled the space. For example, IFC's Infrastructure Crisis Facility initiative ensured the availability of long-term debt to support private infrastructure projects affected by capital shortages because of the global crisis. It was launched in December 2009 with a financial commitment from the German Development Bank (KfW) and pledges from DEG, PROPARCO and EIB worth about $4 billion. Appendix A provides a number of detailed examples of how DFIs have responded to the global financial crisis.

However, in terms of overall outlays, not all DFIs were able to be counter-cyclical during the global financial crisis. The level of new commitments fell in a number of DFIs between 2008 and 2009. Overall, portfolios increased by only 14% in the case of EDFI (12% in 2008 and 21% in 2007), with no growth in the case of IFC (in euros).

Next, we consider whether DFIs are investing in countries where FDI is not going. A large share of the EDFI and IFC portfolio is in African, Caribbean and Pacific (ACP) and South Asian countries, whereas only a small share of the stock of FDI is in the poorest countries (Table 4). Very little of EDFI funding goes to the new EU Member States, whereas a significant share of FDI goes there. Thus, using the broad data in Table 4, it seems that DFI investment is concentrated more in regions where FDI is least present. On the other hand, although the stock of FDI in the poorest economies increased most in 2008-2009, DFI investment changed comparatively little over that period.

Table 4: **FDI and DFIs' portfolios and changes by region, 2008-2009 (%)**

	Portfolio			Change 2008-2009		
	EDFI	IFC	FDI stock	Change in EDFI	Change in IFC	Change in FDI stock
ACP and South Africa	28	11	11	19	3	38
South Asia	13	14	4	16	6	27
South America	11	17	16	24	-(5)	25
New EU Member States	1	3	10	-(35)	-(12)	17
South East Asia	8	7	14	32	-(4)	6
Central America	6	6	7	5	17	5
China	8	6	10	15	-(7)	25
Russia	4	7	5	7	-(19)	18
Commonwealth of Independent States	6	5	8	-(0)	35	17
Other	15	25	13			2
Total	100	100	100	14	0	16

Sources: EDFI, UN Conference on Trade and Development (UNCTAD) and calculations in Kingombe et al. (2010).

Richer countries can attract FDI and access international capital markets more easily than poorer countries. So, to be additional, DFIs should be concentrated more in poorer countries. Figure 1 shows DFI investment as a percentage of GDP against GDP per capita (horizontal axis). There is only a slight negative relationship for the CDC, confirming that DFIs play a slightly important role in poorer countries for the CDC. But it is also clear that there is large variability in country-level DFI exposure across income levels.

Figure 1: Investments by DFIs are not concentrated in the poorest countries, although CDC scores better than IFC and EIB
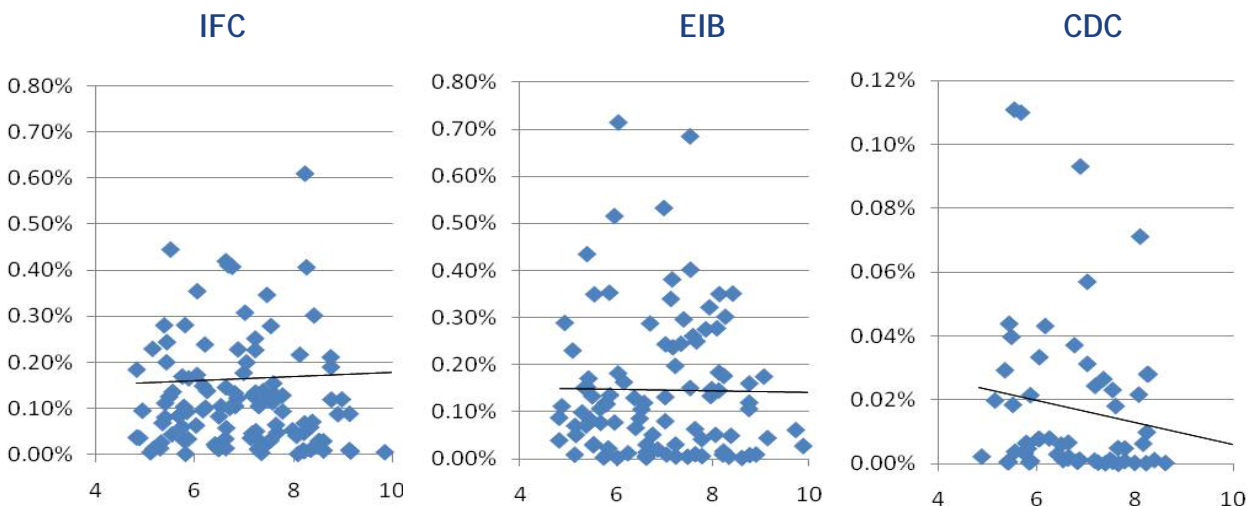
Note: Dots refer to country observations. Country level DFI exposure (as % of GDP) on vertical axis and log of the level of GDP on the horizontal axis. For visibility IFC data for Tonga and Kiribati excluded in figure. EIB is average over 1986-2009; IFC average over 2002-2009, and CDC average over 2004-2009. Lines are trendlines estimated trough the dots.
Source: 150+ developing and emerging economies, DFI=IFC+EIB+CDC (see Appendix B).

Finally, we present the results from the regressions. The dependent variable is the share of investment as a percentage of the GDP (data from World Development Indicators (WDI)). We include the lagged dependent variable, which will account for any unobserved country-specific effects (as long as they remain constant over time). Tests further revealed it is better to use random rather than fixed effects. We include time dummies to account for common shocks over time. Finally, we include measures of DFI investment (as a percentage of GDP). All regressions show that investment rates are persistent over time (the variable on the lagged dependent variable is close to one).

Column (1) of Table 5 shows that EIB exposure is significantly correlated with the investment ratio, meaning that countries with a greater EIB investment in a given year are more likely to have more investment. The same applies for IFC, but the leverage effect is greater in the case of IFC compared with EIB. Thus, when EIB as a share of GDP goes from 0% to 1%, the investment to GDP ratio goes up by 0.5 percentage points; the same shift in IFC is responsible for a 1.3 percentage point shift in the investment ratio. Using the sum IFC and EIB leads to a coefficient of 0.8, implying that a one percentage point increase in DFI as a percentage of GDP would lead to a 0.8 percentage point change in the investment ratio. When we include CDC the coefficient is 0.5. The regressions for EBRD (3) and CDC (5) on their own are not well determined (including when we use lagged variables, as in (6)). This is a much better way of presenting catalytic effects than the static leverage ratios.

We conclude that DFIs are investing in regions relatively underserved by FDI, and DFI investments are relatively more important for poorer than for richer countries. Regressions further show that DFI investments lead to more investment than would otherwise have been the case. Therefore, DFIs are able to increase investment and, owing to their locational presence, are likely to be particularly additional in poorer countries. DFIs could therefore be seen as a useful tool to promote investment and growth in poor countries, so one important

tool for developed countries to support investment during downturns is to increase and not decrease their exposure, as has actually been the case in some DFIs.

Table 5: **Econometric evidence for the catalytic effects of DFIs –
explaining investment to GDP ratios**

	(1)	(2)	(3)	(4)	(5)	(6)
Investment to GDP ratio (-1)	0.86 (91.1)***	0.89 (47.4)***	0.83 (27.7)***	0.88 (47.1)***	0.88 (35.0)***	0.77 (24.5)***
EIB	0.52 (2.07)***					
IFC		1.34 (2.98)***				
EBRD			0.08 (0.19)			
CDC					-2.36 (-.73)	
CDC (-1)						-0.60 (-0.19)
All combined (IFC, EIB)				0.80 (3.20)***		
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Estimation procedure	Random effects	Random effects	Random effects	Random effects	Random effects	Random effects
No. of obs	3061	691	365	691	342	280
No. of countries	143	121	23	121	62	61
Period	1985-2009	2002-2009	1992-2009	2002-2009	2004-2009	2005-2009

Notes: Panel analysis using random effects estimation; IFC and EIB lags are not significant. T-stats between parentheses; *** (**) at 1% (5%) significance.
Source: Own calculations.

We also examine the role played by DFIs in conflict-affected countries. We build on the UN Development Programme Crisis Prevention and Recovery Report 2008 (UNDP, 2008), which lists 31 conflict-affected countries, defining when they are in or out of conflict (see Appendix C). We first calculate the investment to GDP ratio in conflict-affected and other countries, then within conflict-affected countries distinguish further between periods of conflict and post-conflict. Appendix D1 shows that investment to GDP ratios are lowest in the 31 countries during conflict (15%), but during post-conflict periods they increase to around 20% (a 5% peace investment dividend). The average ratio in other countries is 22%. Uganda is added as an example.

We then chart the same ratios for EIB investment as a percentage of GDP. Here, we find that EIB does invest a similar amount (as a percentage of GDP) in conflict-affected and other countries and that, quite clearly, it invests significantly more post-conflict. Uganda again is added as an example. Thus DFIs potentially contribute to post-conflict stabilisation. Finally, we examine the relationship between EIB investment and total fixed investment in Uganda. Table D1 shows it is positive in both regressions and significant in one regression over the period 1985-2009. With the rise of EIB/GDP by 0.2 percentage points (average over 1985-1992 to average over 1993-2009), we find that EIB may have been responsible for an increase in Uganda's investment ratio of a third of a percentage point (0.2*1.70) on average in the post-conflict period (conservative estimate).

5.2   Helping with the transition to a low carbon path

Appendix A provides a number of detailed examples of how DFIs have responded to climate change. How do DFIs affect energy efficiency at country level? Many DFIs are scaling up their investment in clean technology. For example, in sectoral terms, CDC's investment in clean technology grew from 2.9% in 2007 to 5.8% in 2009. DFIs are in general seen as conduits for climate finance, which is likely to improve the overall impact of DFIs on energy efficiency. There is a considerable literature offering examples of how DFIs affect energy efficiency. The purpose here is not to cover this again, but rather to examine macro impacts.

Table 6 presents regressions on the effects of DFIs on energy efficiency, expressed as energy use (kg of oil equivalent) per $1,000 GDP (constant 2005 purchasing power parity (PPP)). The

results show that IFC and EBRD are leading to greater energy efficiency (a negative coefficient means that a higher DFI exposure is associated with less use of energy per unit of GDP), while there are no such effects for EIB (or CDC, not shown) for the particular sample. We also include control variables such as lagged energy efficiency, which covers unobserved country-specific effects, the structure of the economy and the level of income (for this sample period more developed countries tend to be more efficient).

Table 6: **Econometric evidence for the effects of DFIs on energy efficiency**

	(1)	(2)	(3)	(4)
Ln (energy efficiency) lagged	0.95 (61.9)***	0.98 (111.04)***	0.98 (229.4)***	0.97 (110.6)
Ln GDP per capita	-0.044 (-3.45)***	-0.01 (-1.57)	-0.003 (-0.90)	-0.01 (-2.79)***
Share of industry	0.0029 (2.77)***	0.000 (0.44)	0.000 (0.36)	0.000 (0.51)
Share of service	0.0033 (3.26)***	0.001 (0.53)	-0.000 (-1.05)	0.000 (0.85)
IFC		-4.89 (-2.79)**		
EIB			-0.33 (-0.37)	
EBRD	-2.18 (-1.78)*			
IFC and EIB combined				-2.69 (-2.79)***
Time dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Estimation procedure	Random effects	Random effects	Random effects	Random effects
No. of obs	320	413	1784	413
No. of countries	22	86	94	86

Note: T-stats between parentheses; *** (**) at 1% (5%) significance.
Source: Own calculations.

6   Conclusions and policy implications

DFIs have become increasingly important over the past decade. We estimate private sector support by DFIs globally in terms of annual commitments has grown rapidly, from $15.4 billion in 2003, to $21.4 billion in 2005 and $33 billion in 2009. This represents more than a doubling in six years. DFI support is now equivalent to a quarter of ODA. There are 26 developing countries where the (average of) IFC, EIB and CDC together make up between 2% and 12% of total domestic investment. Therefore, examining the macro effects of DFIs on tackling global challenges makes sense.

This paper shifts the debate on measuring the impact of DFIs (especially those aimed at supporting the private sector). Traditional impact assessments, which have developed admirably since 2000, reflect mainly the micro-level focus of DFIs: that DFIs support viable enterprises which could then improve growth and reduce poverty. Current debates are about whether DFIs can support investment during crises, acting counter-cyclically, channelling investment to post-conflict countries and helping countries to transition towards a low carbon economy through improvements in energy efficiency. We argue that DFIs can indeed play an important role in tackling global challenges. This requires an expansion of the focus of DFIs not to address only capital market failures but also market and coordination failures associated with technology adoption and the environment (in some cases DFIs already do this). The measurement of impacts thus needs to reflect the extent to which DFIs contribute towards tackling global challenges.

We have developed a metric for measuring the impact in terms of 1) the ability of DFIs to promote investment (especially during financial crises and in post-conflict situations) and 2) the ability of DFIs to improve energy efficiency. Using standard regression analyses, based on data for EIB, EBRD, IFC and CDC from 1985 onwards (depending on data availability), we find that DFIs have indeed raised investment and improved energy efficiency in recipient countries compared with the constructed counterfactual. A one percentage point increase in investment as a percentage of GDP would lead to a 0.8 percentage point change in the investment ratio. We argue that such evidence is a more appropriate measure of additionality or catalytic effects than the static financial additionality measures presented by DFIs as leverage effects. Further work could examine in which situations DFIs have the greatest leverage impact, but at least on the basis of this paper an *a priori* hypothesis can be that DFIs can tackle global challenges.

We argue that, as DFIs are able to increase investment – and owing to their locational presence they are likely to be particularly additional in poorer countries – they could be seen as a useful tool to promote investment and growth in poor countries. Thus an important tool to address the effects of global financial crises in poor countries would be to increase DFI exposure to such countries in times of crises. This could be achieved in part by maintaining a good pipeline of projects so that, when a crisis hits, DFIs can step in immediately and support a range of projects by playing the counter-cyclical role; and in part by linking better to additional source of finance (e.g. sovereign wealth funds). It also means that pull (softer terms) and push (more investment officers and better incentives) measures could be designed to stimulate DFI investment in post-conflict countries or to tackle global challenges more generally.

Table 7 provides a summary of the main issues and describes the global challenges, a DFI macroeconomic perspective on this, the evidence and some relevant policy issues.

Table 7: Global challenges, macroeconomic evidence and DFI policy issues

Global challenge	Key questions from a macroeconomic perspective	Relevant macro evidence in this paper	Policy issues
Helping the poorest countries overcome financial crises by maintaining their investment rates	Are DFIs investing in poor countries? Do DFIs increase investment in recipient countries?	EIB, EBRD and IFC have the ability to promote investment and growth in poor countries. However, investment is only slightly more exposed (as a % of GDP) to poorer countries for CDC. Not for EIB and IFC.	Prepare for scaling-up of activity during crises through more and better project preparation activities, especially in poor countries (e.g. blending of loans and grants) (e.g. link to G20 high-level panel on infrastructure and EU discussions on blending).
Promoting security by promoting investment in post-conflict countries	Are DFIs investing in conflict-affected countries? Do DFIs allocate more investment post-conflict?	Investment ratio is higher post-conflict, and EIB steps up investment in post-conflict situations.	Use DFIs in post-conflict situations to promote activity. Ensure DFIs understand post-conflict investment opportunities (create incentives for investment officers). (Link DFIs to post-conflict stabilisation discussions.)
Transition to a low-carbon economy	Do DFIs allocate funds to 'green sectors'? Do DFIs have a dynamic environmental effect?	EBRD and IFC are associated with greater energy efficiency.	Link DFIs to Rio+20 and EU discussions on climate finance as well as new G20 on climate finance.

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Appendix A: DFI responses to climate change and the global financial crisis

DFI	New instruments and approaches to financing climate change	Responses to the financial crisis
IFC	• Promoting climate-friendly investments using commercial funds: IFC, along with the World Bank, pledged to grow energy efficiency and new renewable energy lending by an average 20% per year beginning in FY05. This target has been met and exceeded. IFC clean energy lending grew at an annual average of 51% per fiscal year over the past four fiscal years – from $221 million in FY05 to $1,034 million in FY09. • Cleaner production: IFC offers existing and new clients a combined package of cleaner production audits and financing to implement recommendations for improving energy and resource efficiency through low-cost, high-return measures. Programmes are being implemented or developed in Eastern Europe, South Asia, Latin America and Africa. • Clean technology: After a successful pilot using donor funds, IFC is now investing from its own account in early stage clean tech companies and private equity funds. Investments in early stage climate-friendly technologies are centrally coordinated with overall targets, across all sectors and industries, through IFC's Information and Communication Technology Department. • Solar strategy: As solar energy applications have become increasingly commercial and equipment markets global, IFC has responded with an investment strategy across the solar value chain investing in materials, manufacturing, solar applications, and power generation. • Innovative concessional financing: Funding from the Global Environment Facility (GEF) and more recently the Clean Technology Fund has allowed IFC to pilot many pre-commercial sustainable energy projects. Some earlier projects undertaken with GEF support, such as a clean energy financing programme, have established successful models that are now being replicated through mainstream investments. • Carbon finance: IFC has introduced value-added financial products to mitigate risks in the carbon market by leveraging its ability to take long-term projects and risk in emerging markets. IFC, which is AAA-rated, offers a Carbon Delivery Guarantee for credits from projects in developing countries. • Clean energy finance: IFC has partnered with local financial institutions to support specialised financial products for energy efficiency lending. This product is now available in Russia, China, the Philippines and several other countries. • Sustainable investing: IFC is working with public pension funds and other long-term asset holders to promote investment in sustainable businesses in emerging markets. Through a small shift in the trillions of dollars these funds manage, it may be possible to generate a large source of additional resources for climate-friendly investments. IFC is also working with asset managers to develop methodologies to measure the impact of climate change as an element of business risk.	• Global Trade Finance Program: IFC expanded its trade finance programme by increasing its ceiling in 2008 and extending coverage to additional banks and countries. The programme issued $3.46 billion in guarantees in FY10, a 44% increase over the previous year. The programme provides guarantees for trade transactions in more than 80 countries, primarily supporting small and medium enterprises. • Global Trade Liquidity Program: This initiative, launched in 2009 in response to the global financial crisis, has already received three deal of- the-year awards from industry publications for its innovation, focus on public–private partnerships and rapid implementation to increase credit for trade. The programme has financed more than $6 billion of trade volume through 4,000 transactions in 40 countries. About 80% of these transactions benefited have small and medium businesses. Nearly 40% are in lower-income countries. • Microfinance Enhancement Facility: IFC and the KfW launched this initiative to support microfinance institutions, which play a vital role in the fight against poverty. IFC and KfW invested $150 million and $130 million, respectively, to help fundamentally sound microfinance institutions facing severe credit constraints in the wake of the financial crisis. The goal is to provide refinancing to more than 100 microfinance institutions in as many as 40 countries and to support lending to as many as 60 million low-income borrowers. • Debt and Asset Recovery Program: Launched in 2009, this makes direct investments in businesses that need to restructure debt in pools of distressed assets and in specialised companies that manage distressed assets. It also invests indirectly through investment funds that focus on such assets and companies. • Infrastructure Crisis Facility: This initiative ensures the availability of long-term debt to support private infrastructure projects affected by capital shortages because of the global crisis. Launched in December 2009 with a financial commitment from KfW and pledges from DEG, PROPARCO and EIB, it has co-financing arrangements of about $4 billion. It has pledged $100 million to projects in four countries. • Global Agriculture and Food Security Program: A multilateral mechanism to assist in the implementation of pledges made by the G8 and G20 countries to strengthen food security in low-income countries. The programme will channel donor funding — more than $800 million so far — to support public and private initiatives to improve governance, productivity and competitiveness in the agribusiness sector. IFC will manage funding allocated to private initiatives and will provide long- and short-term loans, credit guarantees and equity to local companies and financial intermediaries.

DFI	New instruments and approaches to financing climate change	Responses to the financial crisis
		• Access to Finance: A $9.6 million initiative, jointly funded by donor partners, to help crisis affected financial institutions with small and medium enterprise banking, housing finance, microfinance and leasing. The initiative, which is expected to raise $40 million over three years, also focuses on risk management, distressed-asset management and financial infrastructure. • EBRD, IFC and FMO have joined up with Asia Debt Management Hong Kong (ADM Capital) to establish a regional fund to invest in midsize companies facing financing difficulties as a result of the financial crisis.
EDFI	• Along with the French Development Agency (AFD) and EIB, signed a memorandum of understanding on the Interact Climate Change Fund. The parties intend to establish an investment matching facility to invest in private sector climate change projects in Africa, the Caribbean and the Pacific, Asia and Latin America before the end of 2010.	
EBRD	• Participated in the design of the Climate Investment Funds – a new multi-donor funding initiative providing substantial finance for climate change mitigation and adaptation, managed by the World Bank and executed by the MDBs. EBRD has contributed in particular to its private sector perspective. Kazakhstan, Tajikistan, Turkey and Ukraine are expected to benefit from these funds; the first project (in Turkey) is being prepared for implementation in 2010. • The Sustainable Energy Initiative: EBRD's investment strategy is delivered within the framework of the Sustainable Energy Initiative (SEI), which was launched in 2006 with the aim of increasing financing to address climate change. Based on SEI's success during its first three years of operation, EBRD's Board of Governors in May 2009 approved the medium-term objectives and Phase 2 of the initiative for 2009-2011. This sets a target to invest €3-5 billion in projects by 2011 and to reduce carbon emissions by between 25 and 35 million tonnes a year. During Phase 2 EBRD will boost its industrial, power and municipal infrastructure energy efficiency activities and continue to develop renewable energy and carbon markets. It will also expand further into new areas, such as energy efficiency in buildings and climate change adaptation. SEI is now firmly rooted not only in the energy sector but in all sectors of EBRD activity, including the industrial, financial and infrastructure sectors. • The Multilateral Carbon Credit Fund, jointly managed with EIB. • Engaging in Sustainable Energy Action Plans, which provide EBRD and governments with an enhanced platform to pursue policy improvements and increased investments in support of ever more ambitious financing objectives. During 2009, such plans were signed with the governments of Bulgaria, Kazakhstan, Russia and Ukraine.	• The Vienna Initiative: EBRD played a key role in the inception of the Vienna Initiative in 2009. This brought together the combined forces of the governments and authorities from Western banking groups and their Eastern subsidiaries, the International Monetary Fund (IMF), European institutions and MDBs like EBRD. Funding of €25 billion was pledged over two years for Eastern European banks to on-lend to businesses. • Increasing investments: EBRD increased its investments sharply in 2009, by more than 50%. In 2010, a capital increase was approved, which has paved the way for a further increase in investments in coming years. • EBRD, IFC and FMO have joined up with ADM Capital to establish a regional fund to invest in midsize companies facing financing difficulties as a result of the financial crisis.
FMO	• FMO signs for climate-neutral management at Climate Event with Al Gore. • Created a clean energy investment facility to be managed by E+Co. FMO has set aside $6.65 million, funded by its Access to Energy Fund.	• EBRD, IFC and FMO have joined up with ADM Capital to establish a regional fund to invest in midsize companies facing financing difficulties as a result of the financial crisis.

DFI	New instruments and approaches to financing climate change	Responses to the financial crisis
	Funding also includes a capacity development facility for entrepreneurs in the amount of €0.5 million. The FMO–E+Co agreement is the result of intensive cooperation over the past year and reflects both organizations' goals to create a sustainable marketplace for access to clean energy that will reduce the impact of climate change and alleviate poverty.	
DEG	• Undertook the first systematic international evaluation of how banks in emerging markets are addressing climate risk, along with the consultation of risk and governance research firm RiskMetrics Group and environmental investor coalition Ceres.	• Created an on-call restructuring team of 20 persons. • Reviewed the risk profile of all new customers against the background of the development. • Subjected all disbursements to a special review. • Analysed in depth specific sectors such as the finance sector and the automotive industry. • Contacted all other DFIs with a view to harmonising activities.

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Appendix B: Data on DFIs

Table B1: DFI exposure (% of GDP)

Country	GFCF (avg. 1986-2009)	EIB (avg. 1986-2009)	IFC (avg. 2002-2009)	CDC (avg. 2004-2009)	DFI % of investment (sum of Columns 2,3,4 divided by Column 1)
Tonga	21.97	0.24	2.19	0.03	11.19
Maldives	32.82	0.28	2.35	0.00	8.00
Mauritania	21.65	0.72	0.35	0.01	4.98
Panama	18.13	0.18	0.61	0.03	4.49
Sierra Leone	9.51	0.07	0.28	0.00	3.69
Djibouti	14.41	0.05	0.41	0.04	3.44
Tunisia	24.57	0.69	0.13	0.02	3.40
Ghana	19.32	0.13	0.44	0.02	3.08
Madagascar	16.51	0.35	0.14	0.00	2.96
St Lucia	24.90	0.30	0.41	0.03	2.96
Jordan	24.20	0.40	0.28	0.00	2.81
Mozambique	19.51	0.44	0.11	0.00	2.80
Uganda	16.73	0.17	0.24	0.04	2.74
Zambia	15.26	0.35	0.03	0.02	2.67
Liberia	9.74	0.01	0.23	0.02	2.64
Lebanon	25.63	0.35	0.30	0.00	2.55
Kiribati	62.24	0.12	1.41	0.00	2.45
Congo, Dem. Rep.	11.57	0.09	0.18	0.00	2.34
Cape Verde	30.94	0.53	0.18	0.00	2.29
Malawi	16.75	0.29	0.09	0.00	2.29
Fiji	17.13	0.26	0.12	0.00	2.25
Kenya	18.15	0.18	0.17	0.03	2.13
Swaziland	17.59	0.34	0.04	0.00	2.13
Bolivia	15.16	0.00	0.23	0.09	2.11
Gambia, The	19.31	0.12	0.28	0.01	2.09
Georgia	20.21	0.00	0.41	0.00	2.03
Vanuatu	21.65	0.20	0.23	0.00	1.96
Egypt, Arab Rep.	21.19	0.24	0.13	0.02	1.84
Nicaragua	24.24	0.01	0.42	0.00	1.79
Morocco	24.32	0.38	0.05	0.00	1.76
Solomon Islands	8.24	0.08	0.00	0.06	1.66
Guinea	18.28	0.14	0.16	0.00	1.65
Montenegro	21.66	0.00	0.35	0.00	1.60
Trinidad and Tobago	20.55	0.11	0.21	0.00	1.54
Tanzania	19.57	0.11	0.08	0.11	1.53
Namibia	19.76	0.25	0.05	0.00	1.50
Jamaica	24.72	0.15	0.22	0.00	1.46
Rwanda	16.90	0.08	0.12	0.04	1.46
Mauritius	24.64	0.28	0.00	0.07	1.42
Senegal	21.63	0.16	0.10	0.04	1.39
Seychelles	25.90	0.16	0.19	0.00	1.35
Albania	23.54	0.00	0.31	0.00	1.31
Guyana	30.75	0.29	0.10	0.00	1.26
Burkina Faso	19.82	0.15	0.07	0.03	1.25
Dominica	28.44	0.35	0.00	0.00	1.23
Cameroon	17.15	0.11	0.10	0.00	1.23
Tajikistan	17.04	0.00	0.20	0.00	1.18
Syrian Arab Rep.	21.44	0.24	0.00	0.00	1.12
El Salvador	15.52	0.00	0.15	0.02	1.11
Lesotho	47.15	0.52	0.00	0.00	1.09
Cambodia	16.20	0.00	0.17	0.00	1.07
Bosnia and Herzegovina	23.71	0.00	0.25	0.00	1.06
St Vincent and the Grenadines	30.43	0.32	0.00	0.00	1.06
Togo	17.48	0.03	0.04	0.11	1.06
Mali	22.29	0.15	0.08	0.00	1.04

Country	GFCF (avg. 1986-2009)	EIB (avg. 1986-2009)	IFC (avg. 2002-2009)	CDC (avg. 2004-2009)	DFI % of investment (sum of Columns 2,3,4 divided by Column 1)
Barbados	18.23	0.17	0.00	0.00	0.96
Dominican Rep.	18.71	0.04	0.13	0.00	0.93
Pakistan	17.15	0.01	0.14	0.01	0.92
Benin	16.64	0.12	0.03	0.00	0.89
Papua New Guinea	19.47	0.09	0.08	0.01	0.89
Guinea-Bissau	26.29	0.23	0.00	0.00	0.89
Honduras	23.54	0.01	0.20	0.00	0.89
Guatemala	15.63	0.00	0.14	0.00	0.88
Uruguay	14.48	0.01	0.12	0.00	0.87
Côte d'Ivoire	10.89	0.07	0.02	0.00	0.83
Paraguay	20.51	0.03	0.13	0.00	0.80
Ethiopia	18.90	0.11	0.04	0.00	0.79
Botswana	26.09	0.15	0.05	0.00	0.77
Oman	15.56	0.00	0.12	0.00	0.77
Sri Lanka	23.82	0.03	0.15	0.01	0.76
Philippines	18.87	0.02	0.12	0.00	0.76
Moldova	20.77	0.00	0.15	0.00	0.71
Zimbabwe	17.22	0.13	-0.01	0.00	0.71
Peru	20.51	0.01	0.13	0.00	0.69
Burundi	10.95	0.04	0.04	0.00	0.69
Mongolia	34.46	0.00	0.24	0.00	0.69
Algeria	26.35	0.15	0.03	0.00	0.69
Congo, Rep.	23.87	0.13	0.00	0.03	0.68
Macedonia, FYR	17.83	0.00	0.12	0.00	0.67
Chad	17.21	0.10	0.01	0.00	0.65
Lao PDR	24.62	0.08	0.08	0.00	0.65
South Africa	17.59	0.05	0.04	0.02	0.64
Ukraine	22.14	0.00	0.13	0.00	0.60
Belize	22.38	0.13	0.00	0.00	0.60
Equatorial Guinea	50.02	0.30	0.00	0.00	0.59
Niger	11.02	0.05	0.01	0.00	0.57
Kyrgyz Rep.	19.43	0.00	0.10	0.01	0.56
Colombia	18.35	0.01	0.09	0.00	0.54
Grenada	34.03	0.18	0.00	0.00	0.54
Comoros	14.51	0.08	0.00	0.00	0.53
Romania	21.68	0.00	0.11	0.00	0.52
Argentina	18.95	0.01	0.09	0.00	0.51
Yemen, Rep.	20.18	0.00	0.10	0.00	0.50
Costa Rica	19.85	0.02	0.07	0.01	0.47
Gabon	27.18	0.05	0.07	0.00	0.44
Kazakhstan	23.90	0.00	0.10	0.00	0.44
Vietnam	29.22	0.02	0.09	0.00	0.39
Azerbaijan	28.58	0.00	0.10	0.00	0.37
Suriname	17.42	0.06	0.00	0.00	0.36
Bangladesh	20.49	0.00	0.06	0.00	0.32
Russian Federation	20.53	0.00	0.06	0.00	0.31
Brazil	18.29	0.01	0.05	0.00	0.31
India	24.74	0.00	0.06	0.01	0.29
Chile	22.04	0.00	0.06	0.00	0.29
Eritrea	24.47	0.07	0.00	0.00	0.29
Antigua and Barbuda	46.70	0.04	0.09	0.00	0.28
Central African Rep.	10.33	0.03	0.00	0.00	0.28
St Kitts and Nevis	44.22	0.12	0.00	0.00	0.27
Ecuador	20.46	0.00	0.05	0.00	0.27
Indonesia	24.99	0.01	0.06	0.00	0.26
Angola	16.97	0.01	0.03	0.00	0.23
Bahamas, The	28.15	0.06	0.00	0.00	0.22
Mexico	19.50	0.00	0.03	0.00	0.16
Venezuela, RB	20.39	0.00	0.03	0.00	0.14
Ireland	20.05	0.03	0.00	0.00	0.14
Nepal	20.05	0.00	0.03	0.00	0.13
Belarus	26.82	0.00	0.03	0.00	0.13
Sudan	13.82	0.01	0.00	0.00	0.11

Country	GFCF (avg. 1986-2009)	EIB (avg. 1986-2009)	IFC (avg. 2002-2009)	CDC (avg. 2004-2009)	DFI % of investment (sum of Columns 2,3,4 divided by Column 1)
Thailand	30.35	0.00	0.03	0.00	0.10
Uzbekistan	26.65	0.00	0.02	0.00	0.06
China	34.72	0.00	0.01	0.00	0.05
Saudi Arabia	19.50	0.00	0.01	0.00	0.05
Kosovo	27.04	0.00	0.01	0.00	0.04
Estonia	27.73	0.00	0.01	0.00	0.04
Latvia	24.22	0.00	0.01	0.00	0.04
United Arab Emirates	24.03	0.00	0.01	0.00	0.03
Lithuania	22.73	0.00	0.01	0.00	0.03
Slovak Rep.	28.39	0.00	0.01	0.00	0.03
Kuwait	16.92	0.00	0.00	0.00	0.03
Bhutan	45.93	0.00	0.01	0.00	0.02
Malaysia	28.50	0.00	0.00	0.01	0.02
Korea, Rep.	31.81	0.00	0.01	0.00	0.02
Iran, Islamic Rep.	25.82	0.00	0.00	0.00	0.01
Cuba	14.72	0.00	0.00	0.00	0.01

Note: for further information on data see Massa (2011). IMF data for July-June translated backwards to January-December. All data converted into dollars using average year exchange rates.

Table B2: IFC, EIB and CDC exposure by country (% of total investment)

DFI % of INV>2%	DFI % of INV between 1% and 2%	DFI % of INV between 0.5% and 1%	DFI % of INV between 0 and 0.5%
Tonga	Vanuatu	Barbados	Costa Rica
Maldives	Egypt, Arab Rep.	Dominican Rep.	Gabon
Mauritania	Nicaragua	Pakistan	Kazakhstan
Panama	Morocco	Benin	Vietnam
Sierra Leone	Solomon Islands	Papua New Guinea	Azerbaijan
Djibouti	Guinea	Guinea-Bissau	Suriname
Tunisia	Montenegro	Honduras	Bangladesh
Ghana	Trinidad and Tobago	Guatemala	Russian Federation
Madagascar	Tanzania	Uruguay	Brazil
St Lucia	Namibia	Côte d'Ivoire	India
Jordan	Jamaica	Paraguay	Chile
Mozambique	Rwanda	Ethiopia	Eritrea
Uganda	Mauritius	Botswana	Antigua and Barbuda
Zambia	Senegal	Oman	Central African Rep.
Liberia	Seychelles	Sri Lanka	St Kitts and Nevis
Lebanon	Albania	Philippines	Ecuador
Kiribati	Guyana	Moldova	Indonesia
Congo, Dem. Rep.	Burkina Faso	Zimbabwe	Angola
Cape Verde	Dominica	Peru	Bahamas, The
Malawi	Cameroon	Burundi	Mexico
Fiji	Tajikistan	Mongolia	Venezuela, RB
Kenya	Syrian Arab Rep.	Algeria	Ireland
Swaziland	El Salvador	Congo, Rep.	Nepal
Bolivia	Lesotho	Macedonia, FYR	Belarus
Gambia, The	Cambodia	Chad	Sudan
Georgia	Bosnia and Herzegovina	Lao PDR	Thailand
	St Vincent and the Grenadines	South Africa	Uzbekistan
	Togo	Ukraine	China
	Mali	Belize	Saudi Arabia
		Equatorial Guinea	Kosovo
		Niger	Estonia
		Kyrgyz Rep.	Latvia
		Colombia	United Arab Emirates
		Grenada	Lithuania
		Comoros	Slovak Rep.
		Romania	Kuwait
		Argentina	Bhutan
		Yemen, Rep.	Malaysia
			Korea, Rep.
			Iran, Islamic Rep.
			Cuba

Appendix C: Data on conflict and post-conflict countries

| Country	Major conflict episode(s)	Current status
Afghanistan	1978-1991, 1991-2002, 2005	Ongoing insurgency
Angola	1975-1994, 1997-2002	Peace
Azerbaijan	1991-1994	Peace
Bosnia and Herzegovina	1992-1995	Peace
Burundi	1991-2002	Peace, implementation challenges
Cambodia	1970-1975, 1978-1991	Peace
Chad	1965-1988, 1990, 2006-2007	Revived insurgency
Congo, Dem. Rep.	1996-1997, 1998-2001	Ongoing insurgency
Congo, Rep.	1993-1997, 1998-1999	Peace
Côte d'Ivoire	2002-2004	No comprehensive settlement
Croatia	1991-1993	Peace
El Salvador	19797-1991	Peace
Eritrea	1974-1991	Peace, unresolved border dispute
Ethiopia	1974-1991	Peace, unresolved border dispute
Georgia	1991-1994	Peace, unresolved border dispute
Guatemala	1965-1995	Peace
Guinea-Bissau	1998-1999	Peace
Haiti	1991-1995	Continuing instability
Indonesia (Aceh)	1990-2006	Peace
Kosovo	1998-1999	Peace, unresolved status
Lebanon	1975-1990	No comprehensive settlement
Liberia	1989-1990, 1992-1997, 1999-2003	Peace
Mozambique	1976-1992	Peace
Namibia	1973-1989	Peace
Nepal	1996-2006	Peace
Nicaragua	1978-1979, 1979-1990	Peace (elections April and July 2008)
Papua New Guinea	1989-1996	Peace
Rwanda	1991-1996, 1994, 1998-1999, 2001	Peace
Sierra Leone	1991-1996, 1997-2001	Peace
Solomon Islands	1998-2003	Peace
Somalia (Somaliland region)	1988-1991	Unresolved territorial status
Sri Lanka	1983-2002, 2005-	Ongoing insurgency
Sudan (North/South conflict)	1983-2002	Peace
Tajikistan	1992-1997	Peace
Timor-Leste	1975-1999	Peace
Uganda	1979-1991	Peace

Source: UNDP (2008).

Data sources

| EIB	EIB investment (loans) from EIB website ACP and non-ACP developing countries, as ratio of GDP (from WDI)
IFC	IFC investment (difference between stock this year and previous year, stock by June is for previous year) from IFC annual reports website, as ratio of GDP (from WDIs)
EBRD	EBRD investment (loans and equity) from EBRD website, as ratio of GDP (from WDI)
CDC	CDC new investments (equity) from CDC communication, as % of GDP (from WDI)
Investment to GDP ratio	Gross fixed capital formation (public and private investment) scaled by GDP
Energy efficiency	Energy use (kg of oil equivalent) per $1,000 GDP (constant 2005 PPP)
UNDP	1 if a conflict-affected country was out of conflict, 0 otherwise
Exchange rates	Year average, from World Bank
Ln GDP per capita	Ln of real GDP per capita (from World Bank)
Share of industry	Industry as % of GDP (from WDI)

Appendix D: Investing in post-conflict countries: a role for DFIs?

Figure D1: Gross fixed capital formation (% of GDP)
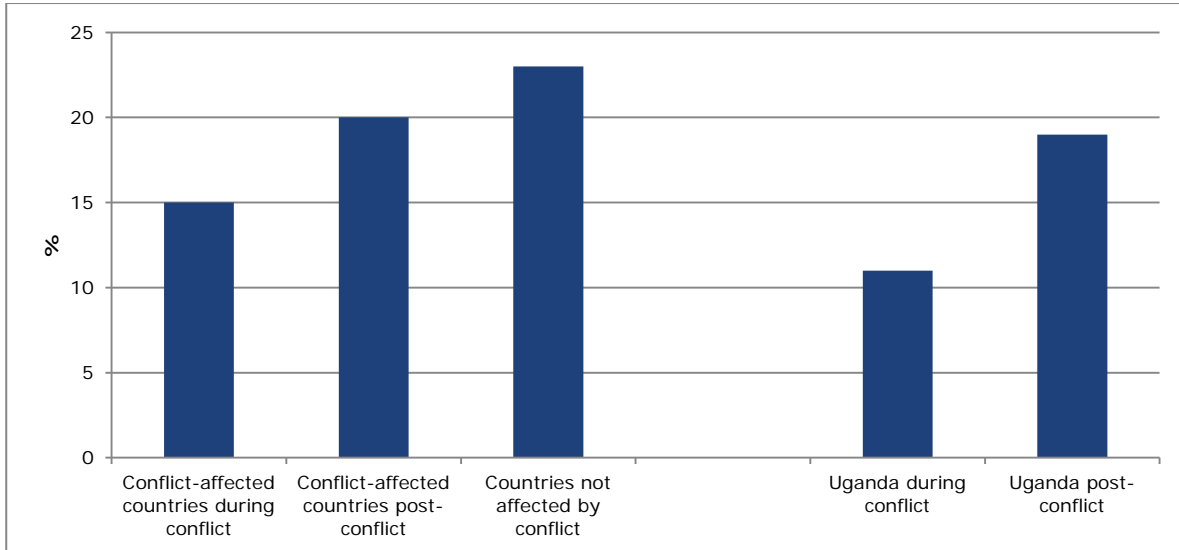
Note: 31 countries are conflict-affected; 153 countries not affected by conflict included as reference. Uganda included as example (in conflict pre-1992).

Figure D2: EIB new investments, average 1985-2009 (% of GDP)
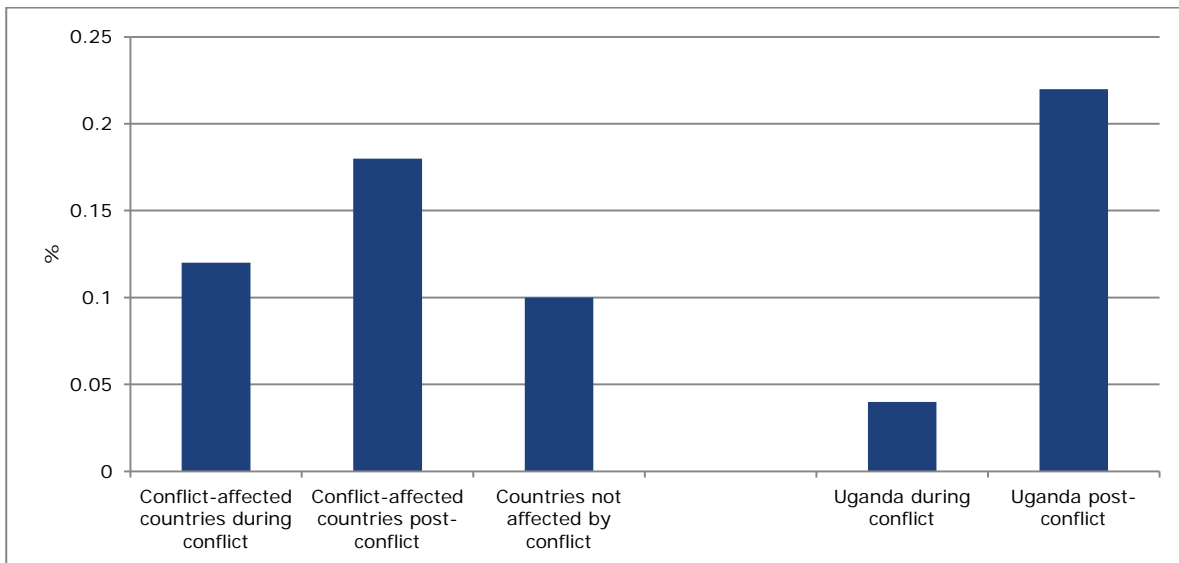
Note: 31 countries are "conflict-affected" and 120 countries not affected by conflict included as reference. Uganda included as example (in conflict pre-1992)

Table D1: Investment to GDP in Uganda

	Investment ratio	Investment ratio
EIB	4.81 (2.94)***	1.70 (1.54)
UNDP conflict dummy		0.08 (6.46)
Constant	0.16 (14.6)**	0.11 (12.5)**
Estimation procedure	Robust estimation	Robust estimation
No. of obs	25	25
Period	1985-2009	1985-2009

Note: Dummy UNDP is 1 for 1992 onwards.